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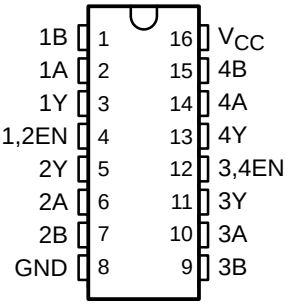
Jameco Part Number 25232

MC3486
QUADRUPLE DIFFERENTIAL LINE RECEIVER WITH 3-STATE OUTPUTS

SLLS097B – JUNE 1980 – REVISED MAY 1995

- **Meets or Exceeds the Requirements of ANSI Standards EIA/TIA-422-B and EIA/TIA-423-B and ITU Recommendations V.10 and V.11**
- **3-State, TTL-Compatible Outputs**
- **Fast Transition Times**
- **Operates From Single 5-V Supply**
- **Designed to Be Interchangeable With Motorola™ MC3486**

D OR N PACKAGE
(TOP VIEW)



description

The MC3486 is a monolithic quadruple differential line receiver designed to meet the specifications of ANSI Standards EIA/TIA-422-B and EIA/TIA-423-B and ITU Recommendations V.10 and V.11. The MC3486 offers four independent differential-input line receivers that have TTL-compatible outputs. The outputs utilize 3-state circuitry to provide a high-impedance state at any output when the appropriate output enable is at a low logic level.

The MC3486 is designed for optimum performance when used with the MC3487 quadruple differential line driver. It is supplied in a 16-pin package and operates from a single 5-V supply.

The MC3486 is characterized for operation from 0°C to 70°C.

FUNCTION TABLE
(each receiver)

DIFFERENTIAL INPUTS A–B	ENABLE	OUTPUT Y
$V_{ID} \leq 0.2$ V	H	H
-0.2 V $< V_{ID} < 0.2$ V	H	?
$V_{ID} \leq -0.2$ V	H	L
Irrelevant	L	Z
Open	H	?

H = high level, L = low level, Z = high impedance (off),
? = indeterminate

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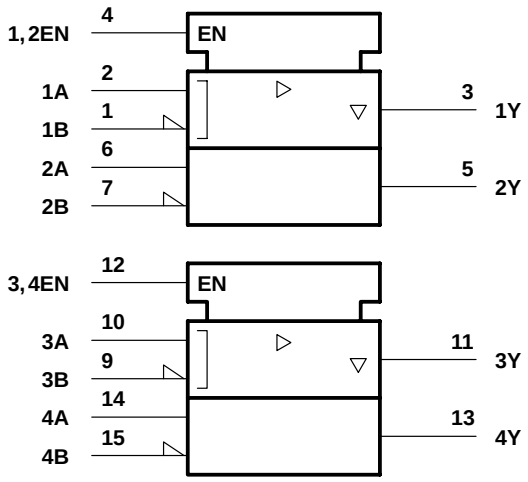
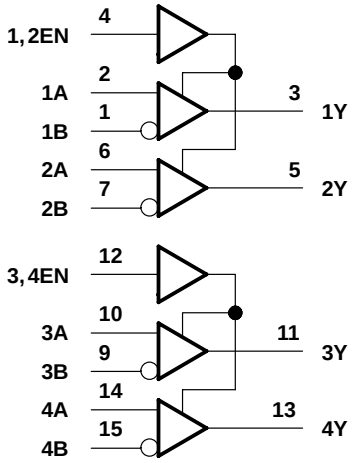
logic symbol†

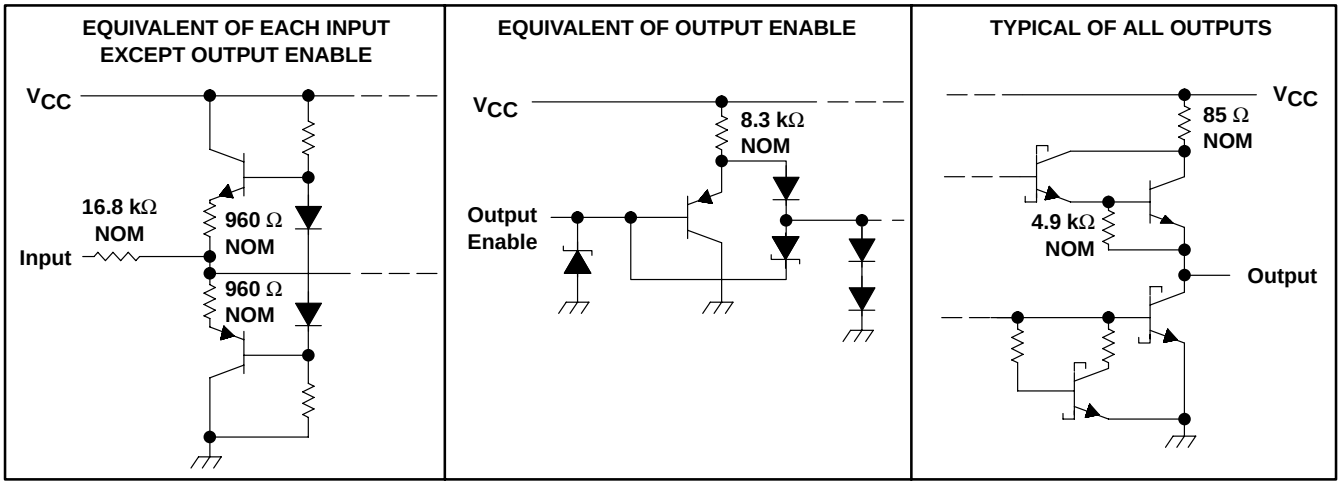


logic diagram (positive logic)



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

schematics of inputs and outputs



absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

Supply voltage, V_{CC} (see Note 1) . . . . . 8 V
Input voltage, V_I (A or B inputs) . . . . . ±15 V
Differential input voltage, V_{ID} (see Note 2) . . . . . ±25 V
Enable input voltage . . . . . 8 V
Low-level output current, I_{OL} . . . . . 50 mA
Continuous total power dissipation . . . . . See Dissipation Rating Table
Operating free-air temperature range, T_A . . . . . 0°C to 70°C
Storage temperature range, T_{stg} . . . . . –65°C to 150°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds . . . . . 260°C

† Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTES: 1. All voltage values, except differential-input voltage, are with respect to network ground terminal.
2. Differential-input voltage is measured at the noninverting input with respect to the corresponding inverting input.

DISSIPATION RATING TABLE

PACKAGE	$T_A \le 25°C$ POWER RATING	DERATING FACTOR ABOVE $T_A = 25°C$	$T_A = 70°C$ POWER RATING
D	950 mW	7.6 mW/°C	608 mW
N	1150 mW	9.2 mW/°C	736 mW

recommended operating conditions

	MIN	NOM	MAX	UNIT
Supply voltage, V_{CC}	4.75	5	5.25	V
Common-mode input voltage, V_{IC}			±7	V
Differential input voltage, V_{ID}			±6	V
High-level enable input voltage, V_{IH}	2			V
Low-level enable input voltage, V_{IL}			0.8	V
Operating free-air temperature, T_A	0		70	°C

electrical characteristics over recommended ranges of common-mode input voltage, supply voltage, and operating free-air temperature (unless otherwise noted)

PARAMETER		TEST CONDITIONS			MIN	MAX	UNIT
V_{IT+}	Differential input high-threshold voltage	V_O = 2.7 V,	I_O = –0.4 mA			0.2	V
V_{IT-}	Differential input low-threshold voltage	V_O = 0.5 V,	I_O = –8 mA		–0.2†		V
V_{IK}	Enable-input clamp voltage	I_I = –10 mA				–1.5	V
V_{OH}	High-level output voltage	V_{ID} = 0.4 V, I_O = –0.4 mA, See Note 3 and Figure 1			2.7		V
V_{OL}	Low-level output voltage	V_{ID} = –0.4 V, I_O = 8 mA, See Note 3 and Figure 1				0.5	V
I_{OZ}	High-impedance-state output current	V_{IL} = 0.8 V,	V_{ID} = –3 V,	V_O = 2.7 V		40	μA
		V_{IL} = 0.8 V,	V_{ID} = 3 V,	V_O = 0.5 V		–40	
I_{IB}	Differential-input bias current	V_{CC} = 0 V or 5.25 V, Other inputs at 0 V		V_I = –10 V		–3.25	mA
				V_I = –3 V		–1.5	
				V_I = 3 V		1.5	
				V_I = 10 V		3.25	
I_{IH}	High-level enable input current	V_I = 5.25 V				100	μA
		V_I = 2.7 V				20	
I_{IL}	Low-level enable input current	V_I = –0.5 V				–100	μA
I_{OS}	Short-circuit output current	V_{ID} = 3 V,	V_O = 0,	See Note 4	–15	–100	mA
I_{CC}	Supply current	V_{IL} = 0				85	mA

† The algebraic convention, in which the least positive (most negative) limit is designated as minimum, is used in this data sheet for threshold voltages only.

NOTES: 3. Refer to ANSI Standards EIA/TIA-422-B and EIA/TIA-423-B for exact conditions.
4. Only one output should be shorted at a time.

switching characteristics, V_{CC} = 5 V, C_L = 15 pF, T_A = 25°C

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PHL}	Propagation delay time, high- to low-level output	See Figure 2		28	35	ns
t_{PLH}	Propagation delay time, low- to high-level output			27	30	ns
t_{PZH}	Output enable time to high level	See Figure 3		13	30	ns
t_{PZL}	Output enable time to low level			20	30	ns
t_{PHZ}	Output disable time from high level			26	35	ns
t_{PLZ}	Output disable time from low level			27	35	ns

PARAMETER MEASUREMENT INFORMATION

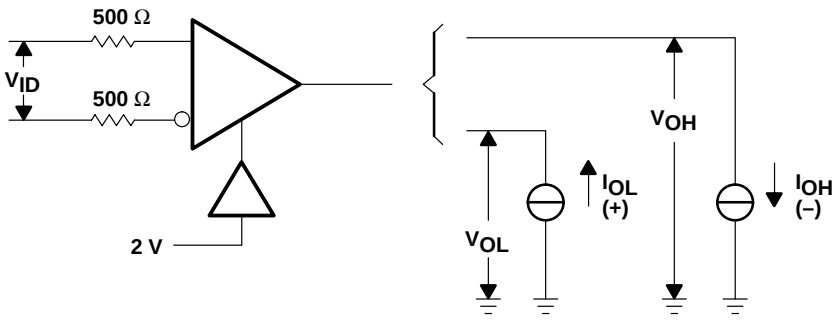
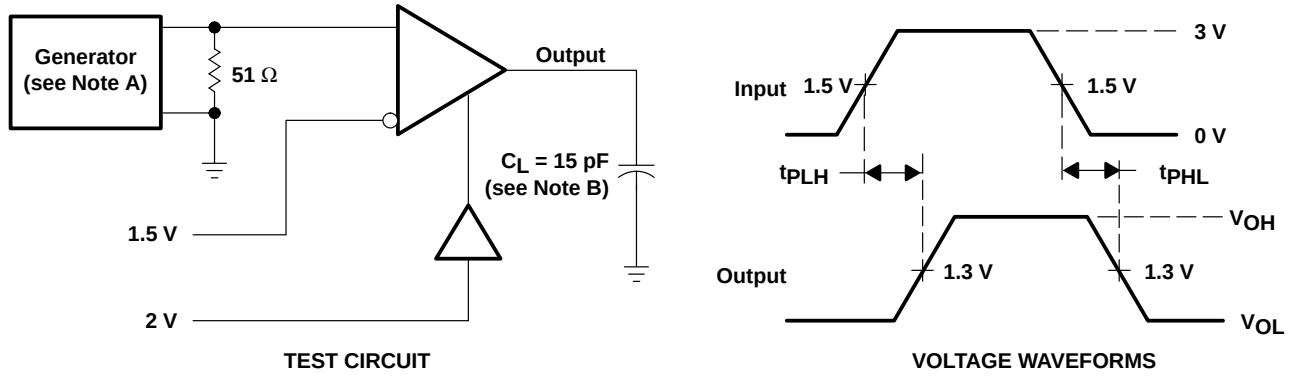


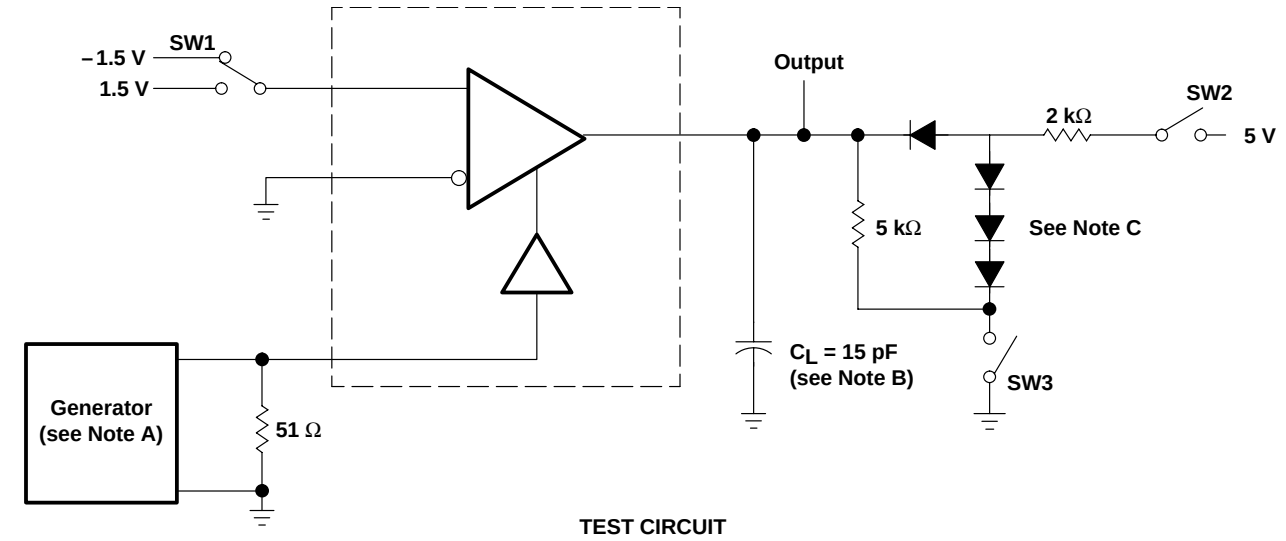
Figure 1. V_{OH}, V_{OL}



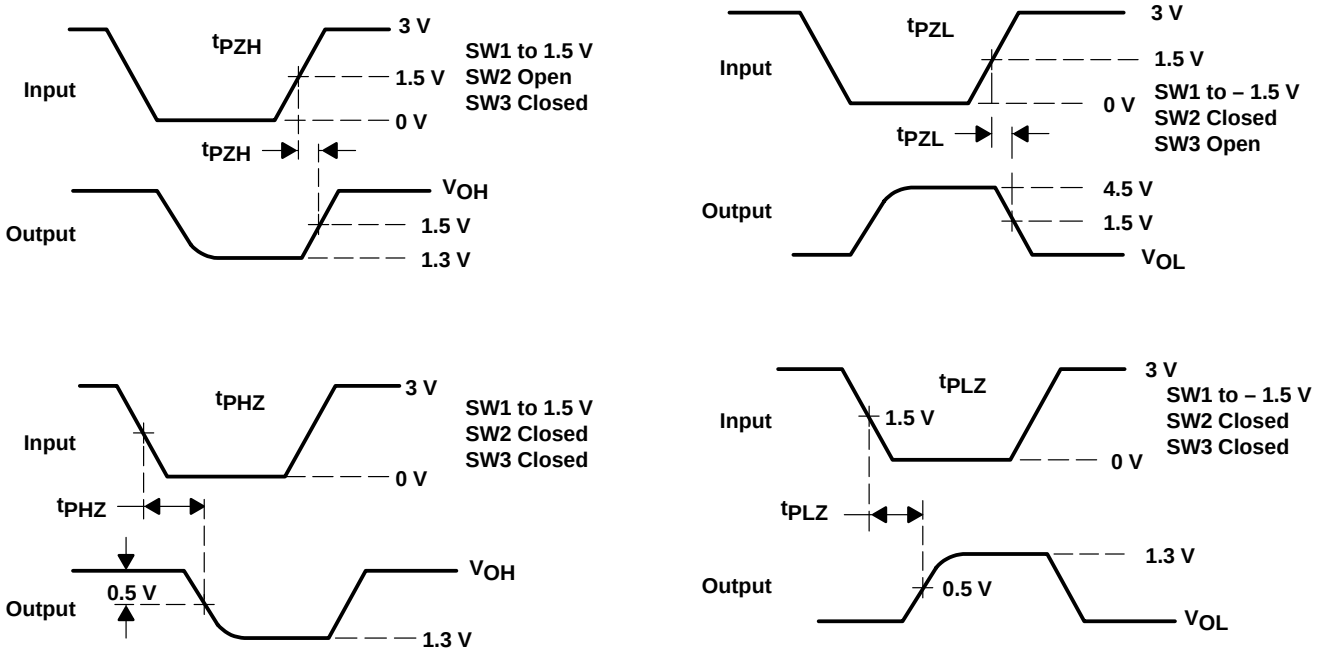
NOTES: A. The input pulse is supplied by a generator having the following characteristics: PRR ≤ 1 MHz, duty cycle = 50%, t_r ≤ 6 ns, t_f ≤ 6 ns.
B. C_L includes probe and stray capacitance.

Figure 2. Test Circuit and Voltage Waveforms

PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT



NOTES: A. The input pulse is supplied by a generator having the following characteristics: PRR ≤ 1 MHz, duty cycle = 50%, t_r ≤ 6 ns, t_f ≤ 6 ns.
B. C_L includes probe and stray capacitance.
C. All diodes are 1N916 or equivalent.

Figure 3. Test Circuit and Voltage Waveforms

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